

# Ten Key Principles in Modeling Natural Gas Markets



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# **Top-10 List for Natural Gas Modeling**

- Prices and flows reflect engineering constraints in a regulated industry.
- Liberalization causes prices and flows to reflect economic opportunities.
- Higher prices allow producers to drill for more expensive sources.
- Higher prices reduce natural gas demand.

# Multi-Faceted Demand Response

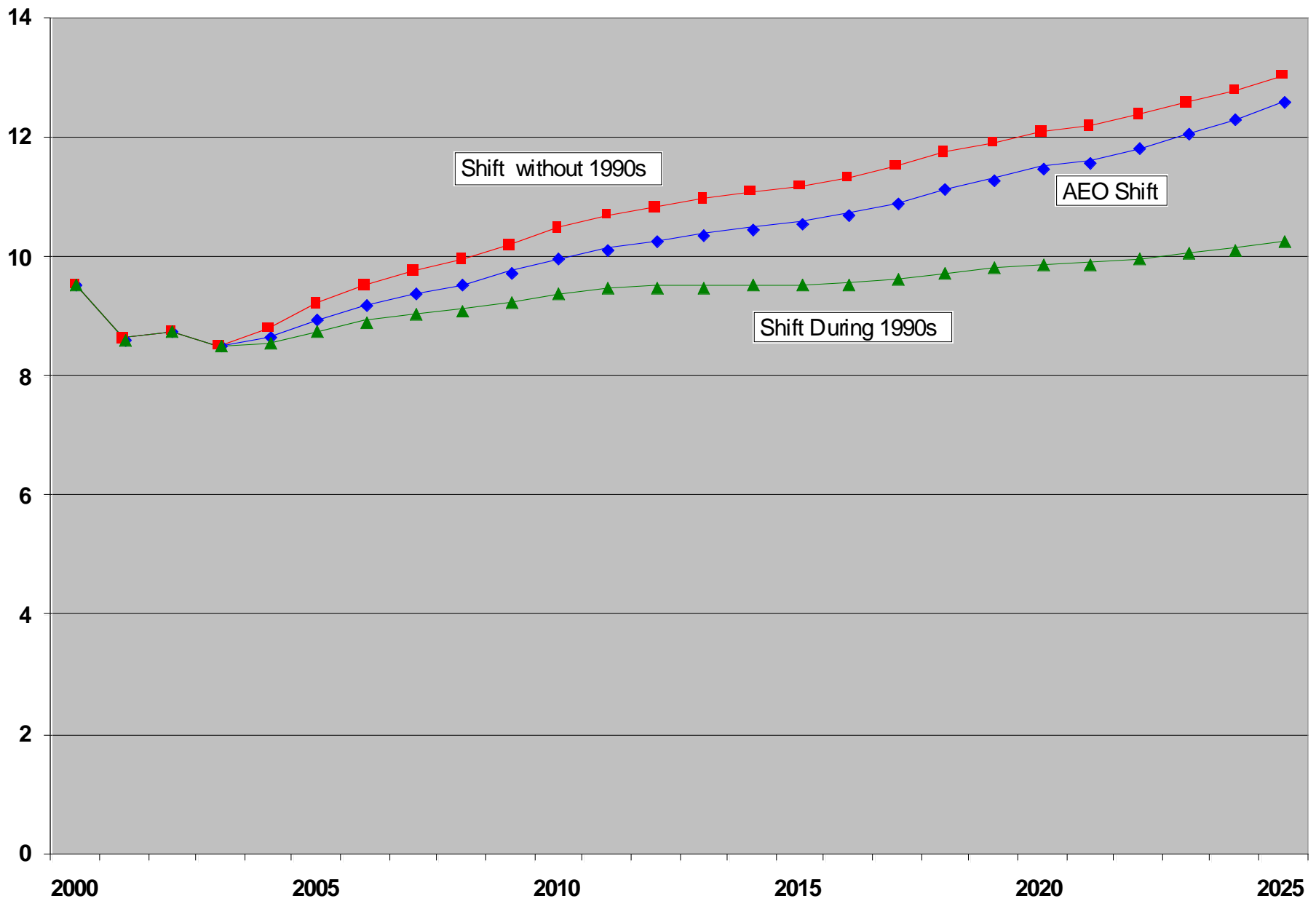
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- Multi-fuel burning equipment.
- Indirect substitution of different plants.
- Substituting towards/from baseload.
- Over time, newer vintages appear
  - Choose fuel
  - Change fuel efficiency
- Aggregate energy adjustments where no other fuel is substituted.
  - Replace energy with labor and capital
  - Demand destruction/overseas outsourcing

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- Industrial structure influences natural gas demand.

## Industrial Natural Gas Consumption (Tcf), 2000-2025

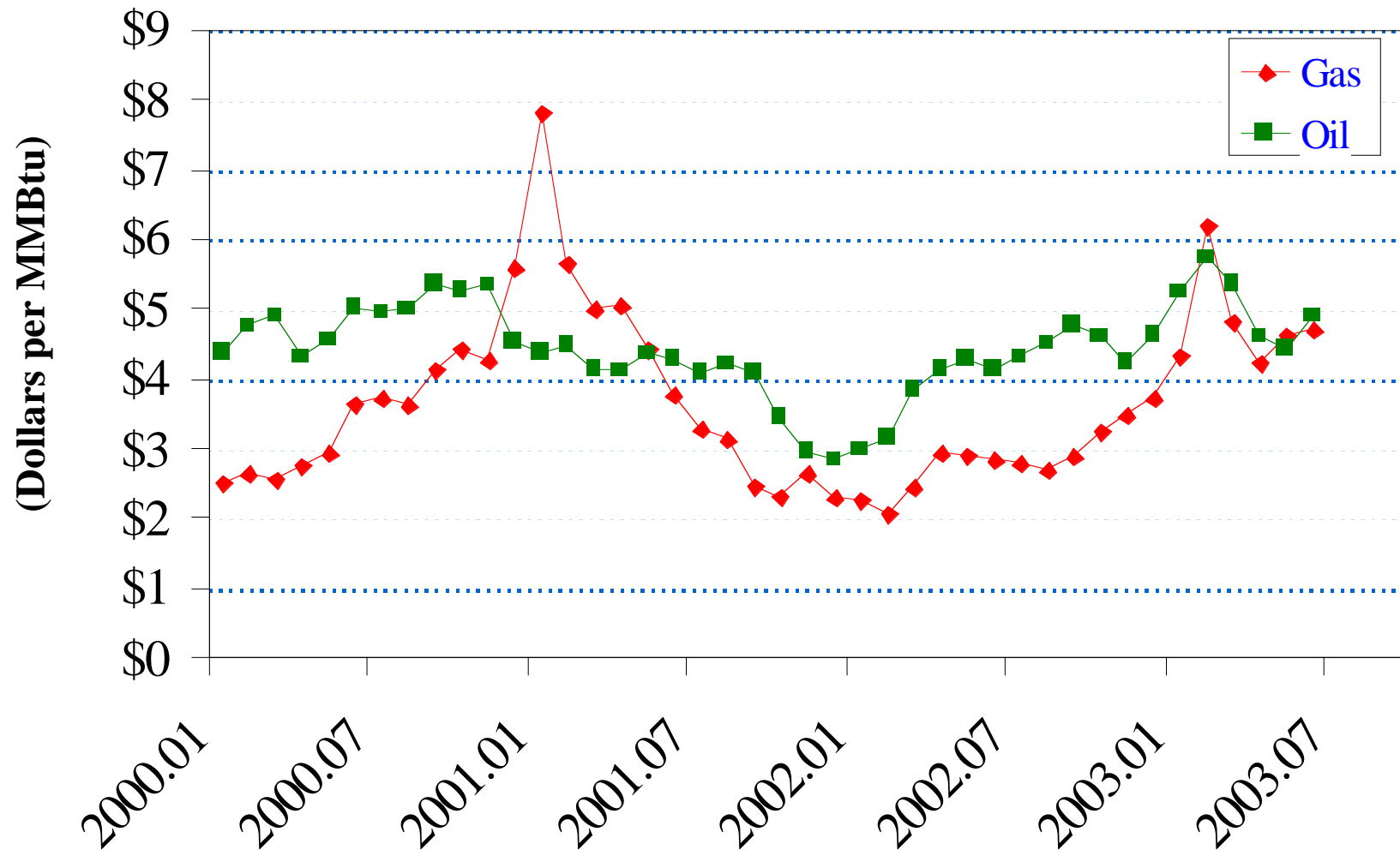


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- Prices are very volatile in the near term.

# Wellhead Natural Gas and Crude Oil Price

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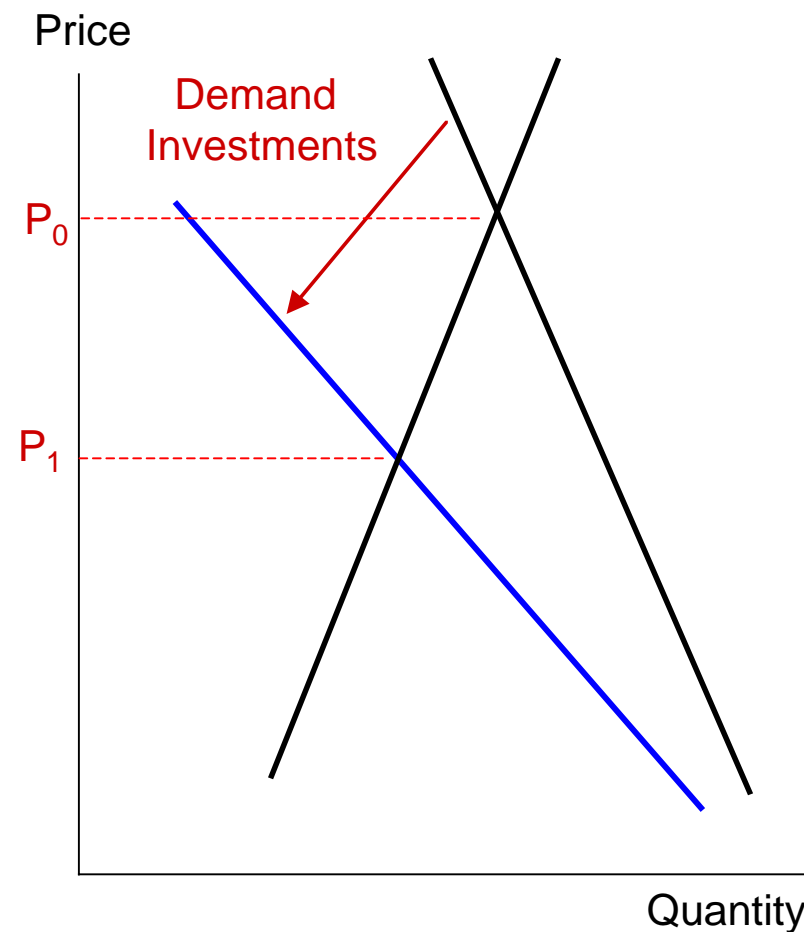
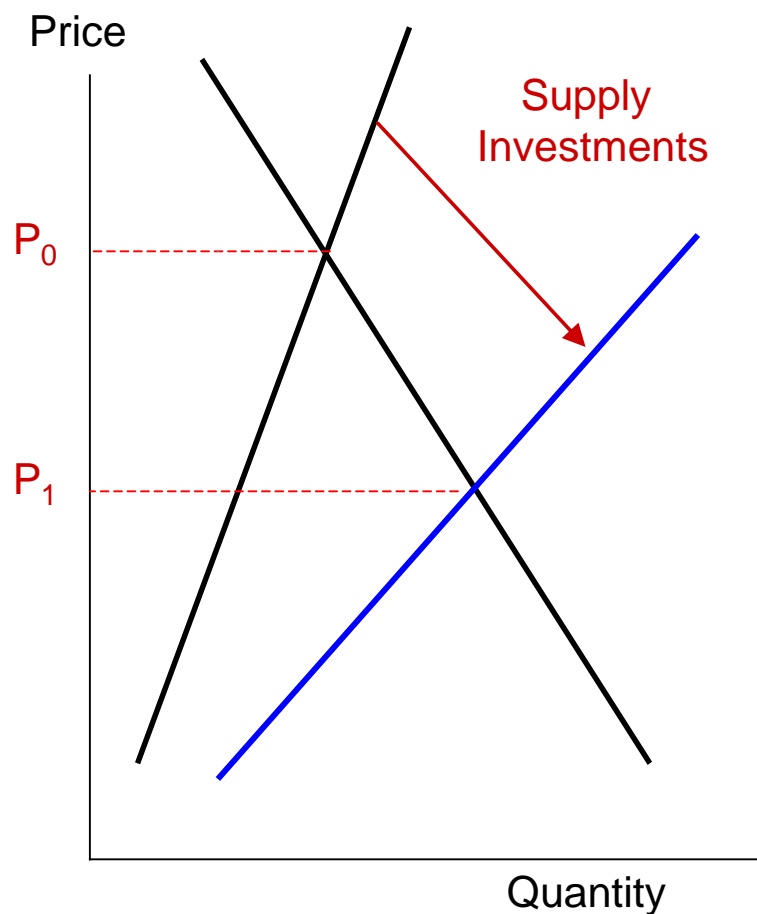


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- In the longer run, investment and technology stabilizes the price path.



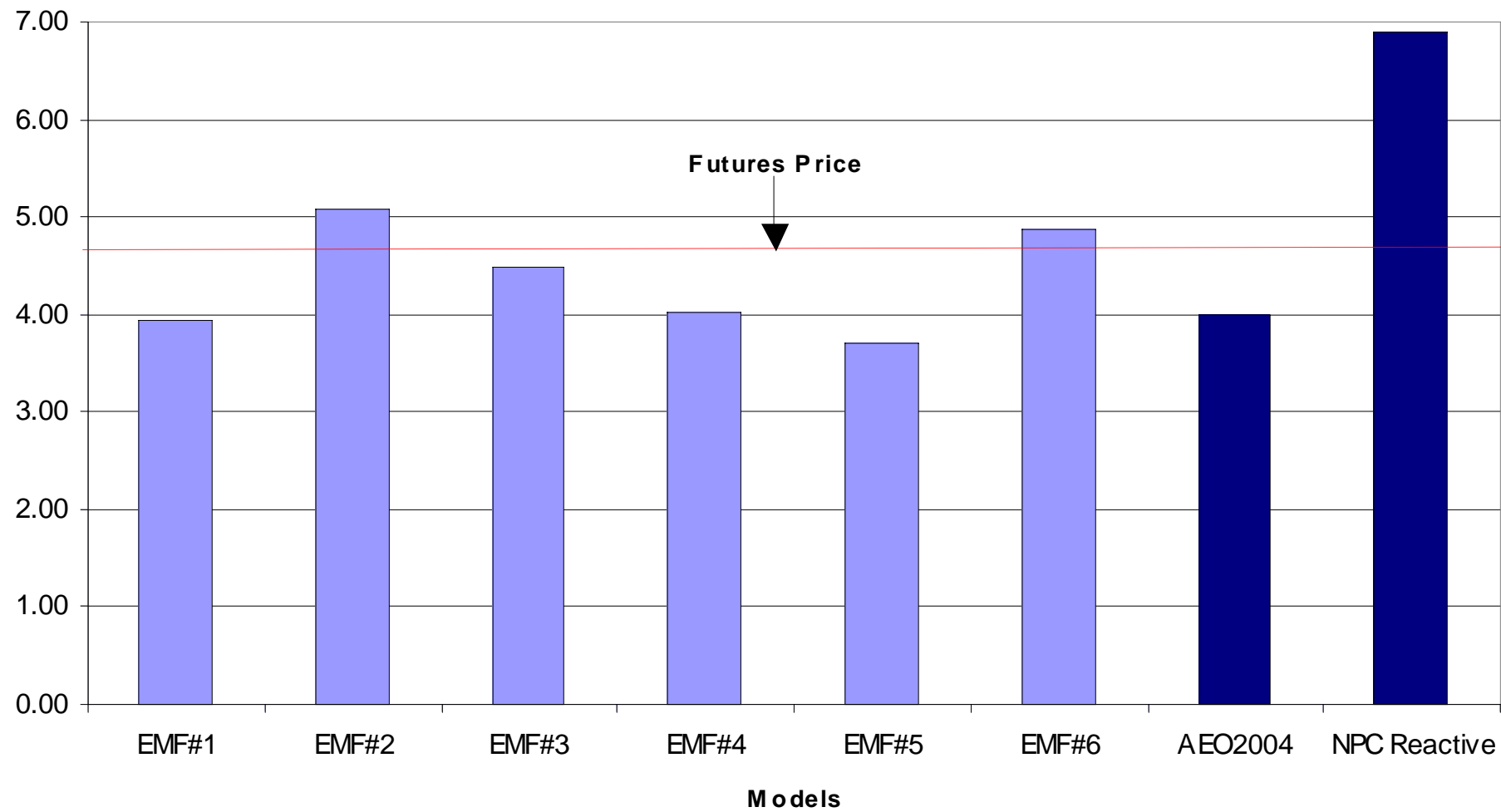
# Investments Alter Long-Run Schedules and Prices



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- In the longer run, investment and technology stabilizes the price path.
- Today's price is a poor predictor of tomorrow's price.
- Financial markets expect future prices to rise less than inflation.

**Figure 1. Projected 2010 Prices ( Nominal \$ / Million Btu)**



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- Today's price is a poor predictor of tomorrow's price.
- Financial markets expect future prices to rise less than inflation.
- Gas & oil prices do not equilibrate; but they are related.